

P & N-Channel 150-V (D-S)

Key Features:

- Low $r_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed

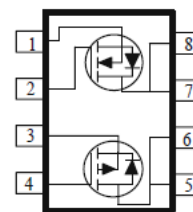
Typical Applications:

- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits



RoHS
COMPLIANT
HALOGEN
FREE

DFN5x6-8L



PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (m Ω)	I_D (A)
150	255 @ $V_{GS} = 10V$	2.6
	290 @ $V_{GS} = 4.5V$	2.4
-150	500 @ $V_{GS} = -10V$	-1.8
	530 @ $V_{GS} = -4.5V$	-1.7

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter		Symbol	Nch Limit	Pch Limit	Units
Drain-Source Voltage		V_{DS}	150	-150	V
Gate-Source Voltage		V_{GS}	± 20	± 20	
Continuous Drain Current ^a	$T_A = 25^\circ\text{C}$	I_D	2.6	-1.8	A
	$T_A = 70^\circ\text{C}$		2	-1.5	
Pulsed Drain Current ^b		I_{DM}	10	-10	
Continuous Source Current (Diode Conduction) ^a		I_S	3	-3	A
Power Dissipation ^a	$T_A = 25^\circ\text{C}$	P_D	2.5	2.5	W
	$T_A = 70^\circ\text{C}$		1.6	1.6	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150		$^\circ\text{C}$

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Maximum	Units
Maximum Junction-to-Ambient ^a	$t \leq 10$ sec	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
	Steady State		110	

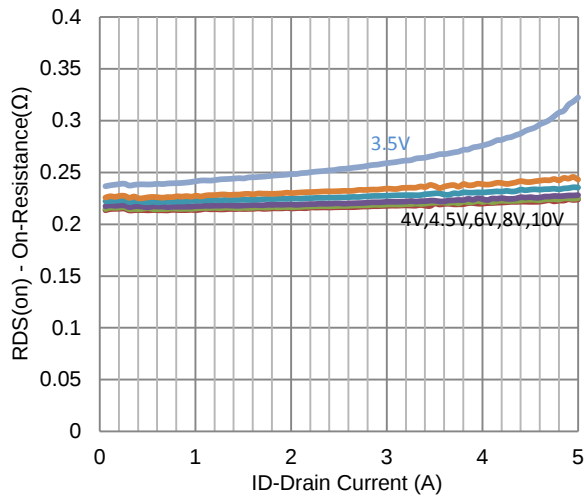
Notes

- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature

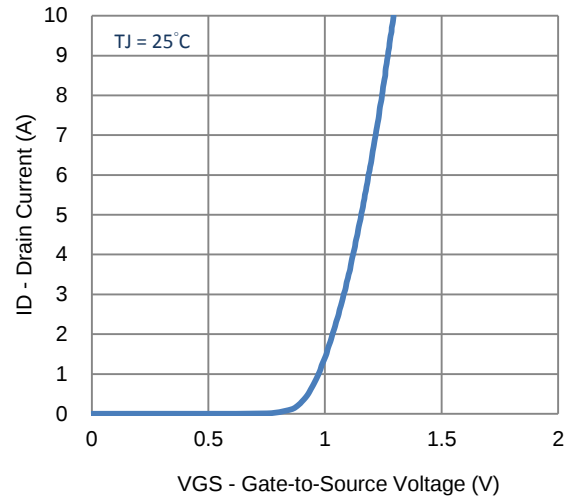
Electrical Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$ (N-ch)	1			V
		$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$ (P-ch)	-1			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 120\text{ V}, V_{GS} = 0\text{ V}$ (N-ch)			1	μA
		$V_{DS} = -120\text{ V}, V_{GS} = 0\text{ V}$ (P-ch)			-1	
On-State Drain Current	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$ (N-ch)	1.3			A
		$V_{DS} = -5\text{ V}, V_{GS} = -10\text{ V}$ (P-ch)	-0.9			A
Drain-Source On-Resistance	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 2.1\text{ A}$ (N-ch)			255	$\text{m}\Omega$
		$V_{GS} = 4.5\text{ V}, I_D = 2.0\text{ A}$ (N-ch)			290	
		$V_{GS} = -10\text{ V}, I_D = -1.4\text{ A}$ (P-ch)			500	$\text{m}\Omega$
		$V_{GS} = -4.5\text{ V}, I_D = -1.3\text{ A}$ (P-ch)			530	
Forward Transconductance	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 2.1\text{ A}$ (N-ch)		11		S
		$V_{DS} = -15\text{ V}, I_D = -1.4\text{ A}$ (P-ch)		11		S
Diode Forward Voltage	V_{SD}	$I_S = 1.5\text{ A}, V_{GS} = 0\text{ V}$ (N-ch)		0.77		V
		$I_S = -1.5\text{ A}, V_{GS} = 0\text{ V}$ (P-ch)		0.77		V
Dynamic						
Total Gate Charge	Q_g	N - Channel $V_{DS} = 75\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 2.1\text{ A}$		10		nC
Gate-Source Charge	Q_{gs}			4.0		
Gate-Drain Charge	Q_{gd}			4.7		
Total Gate Charge	Q_g	P - Channel $V_{DS} = -75\text{ V}, V_{GS} = -4.5\text{ V},$ $I_D = -1.4\text{ A}$		6		nC
Gate-Source Charge	Q_{gs}			2.0		
Gate-Drain Charge	Q_{gd}			2.9		
Turn-On Delay Time	$t_{d(on)}$	N - Channel $V_{DD} = 75\text{ V}, R_L = 35.7\text{ }\Omega, I_D = 2.1\text{ A},$ $V_{GEN} = 10\text{ V}, R_{GEN} = 6\text{ }\Omega$		7		ns
Rise Time	t_r			7		
Turn-Off Delay Time	$t_{d(off)}$			47		
Fall Time	t_f			20		
Turn-On Delay Time	$t_{d(on)}$	P - Channel $V_{DD} = -75\text{ V}, R_L = 53.6\text{ }\Omega,$ $I_D = -1.4\text{ A},$ $V_{GEN} = -10\text{ V}, R_{GEN} = 6\text{ }\Omega$		8		ns
Rise Time	t_r			7		
Turn-Off Delay Time	$t_{d(off)}$			96		
Fall Time	t_f			79		
Input Capacitance	C_{iss}	N - Channel $V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		1016		pF
Output Capacitance	C_{oss}			83		
Reverse Transfer Capacitance	C_{rss}			40		
Input Capacitance	C_{iss}	P - Channel $V_{DS} = -15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		1008		pF
Output Capacitance	C_{oss}			100		
Reverse Transfer Capacitance	C_{rss}			61		

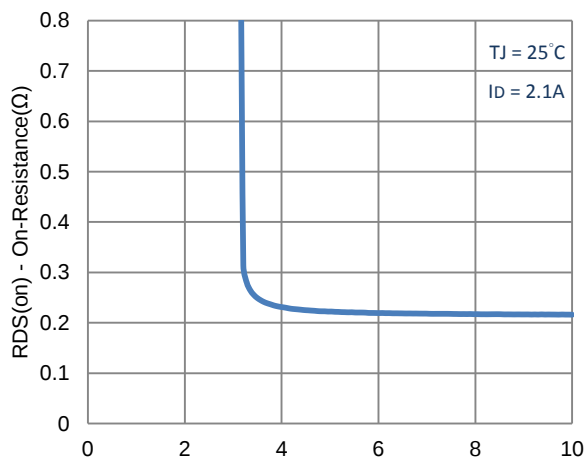
Typical Electrical Characteristics - N-channel



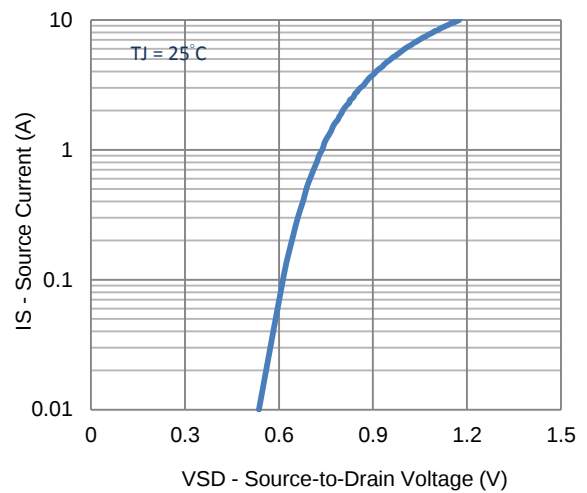
1. On-Resistance vs. Drain Current



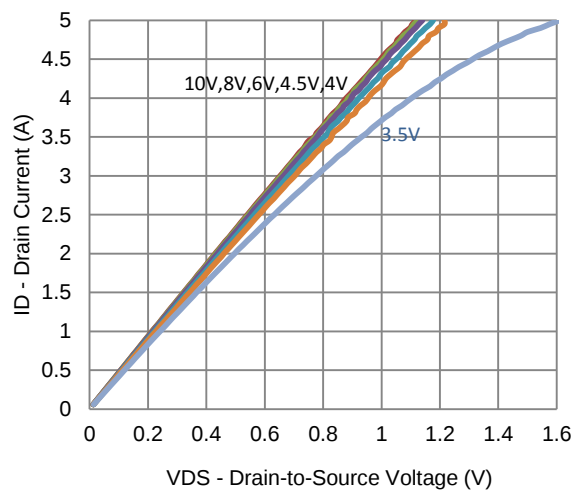
2. Transfer Characteristics



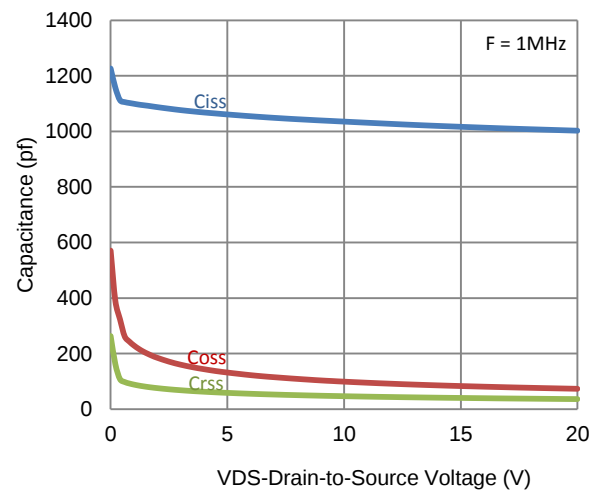
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

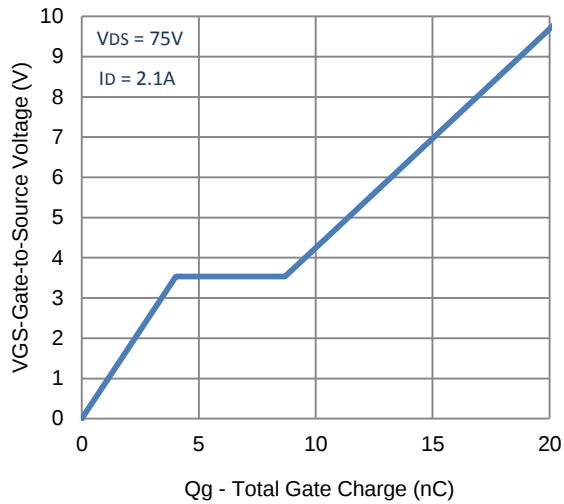


5. Output Characteristics

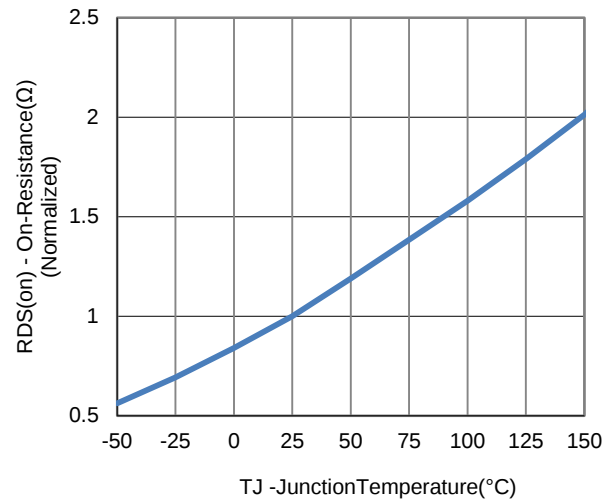


6. Capacitance

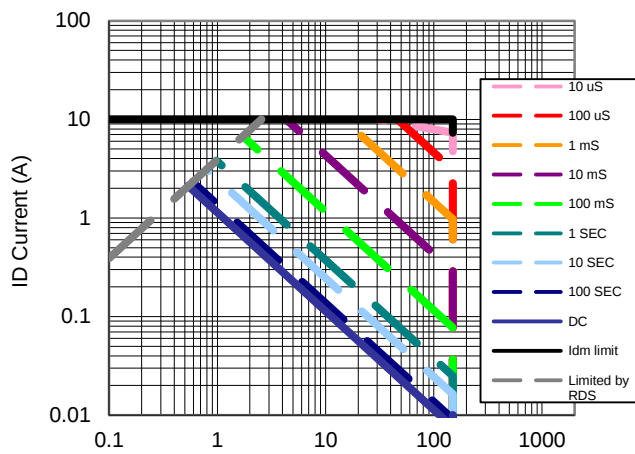
Typical Electrical Characteristics - N-channel



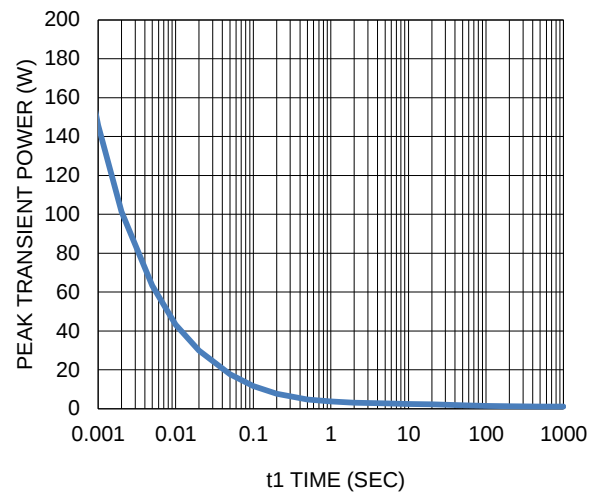
7. Gate Charge



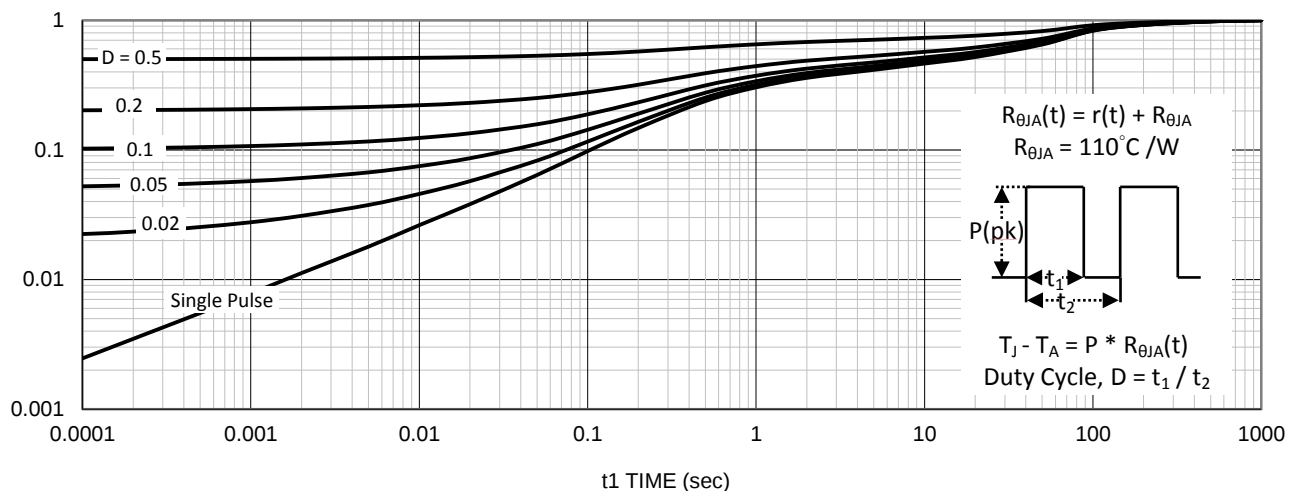
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

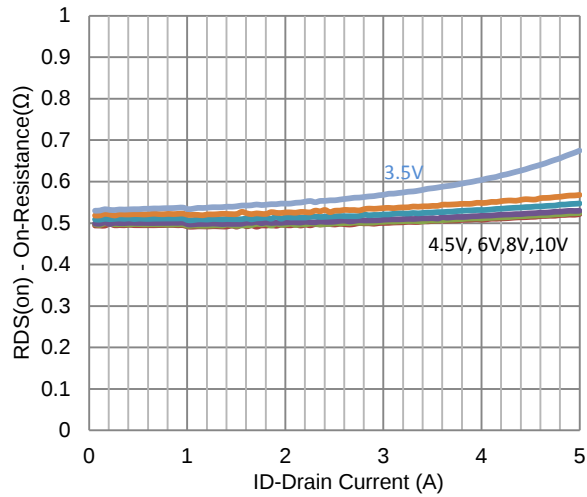


10. Single Pulse Maximum Power Dissipation

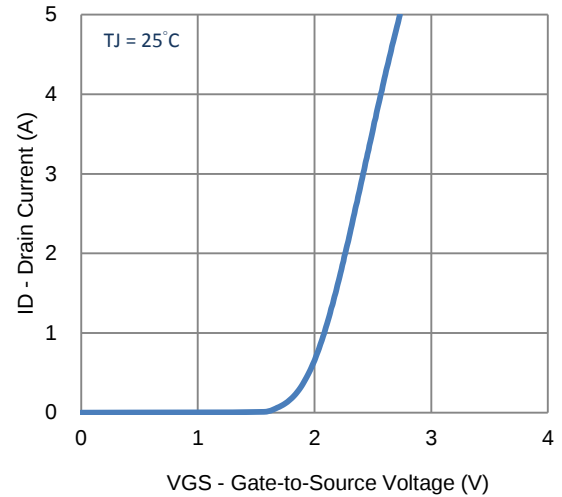


11. Normalized Thermal Transient Junction to Ambient

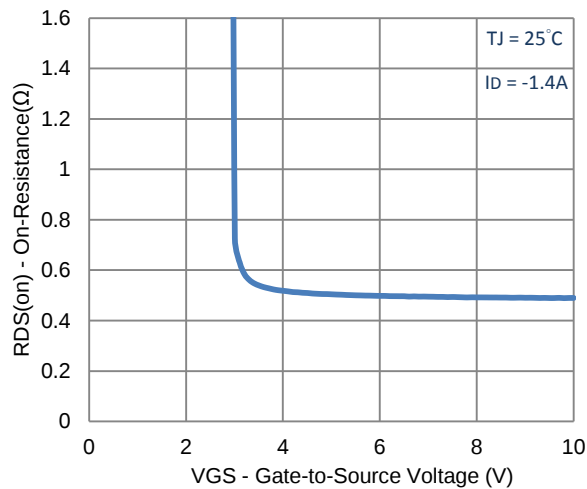
Typical Electrical Characteristics - P-channel



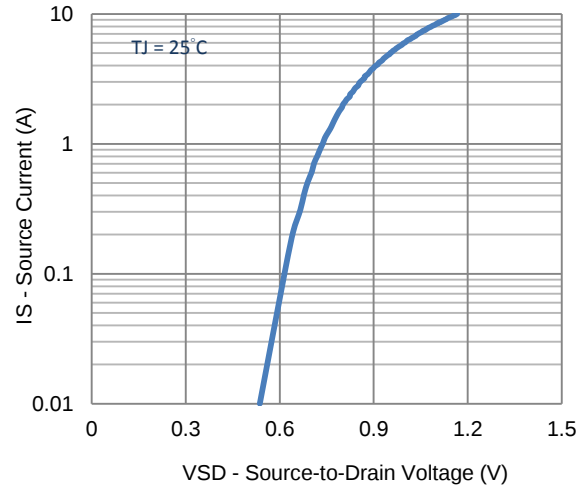
1. On-Resistance vs. Drain Current



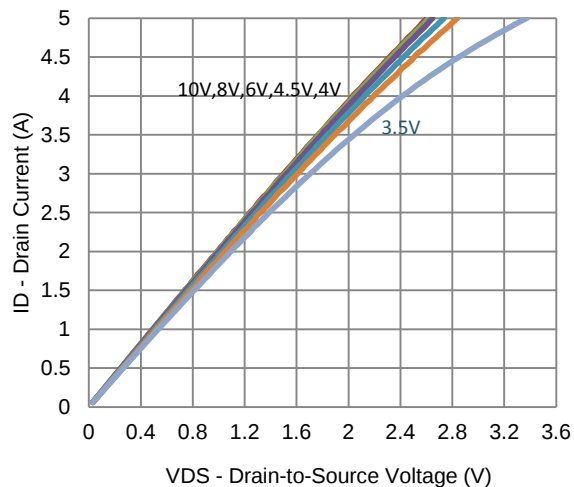
2. Transfer Characteristics



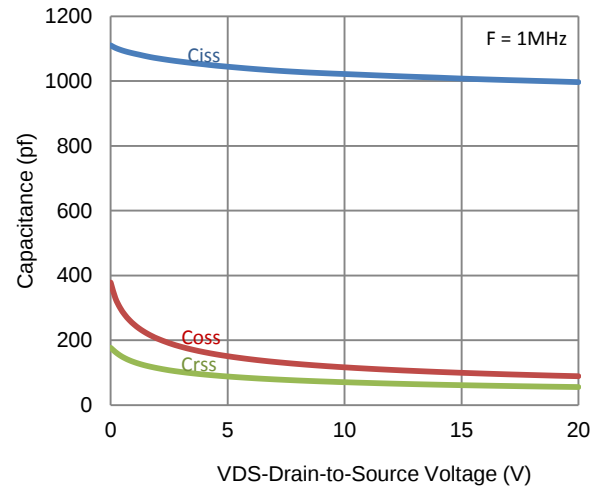
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

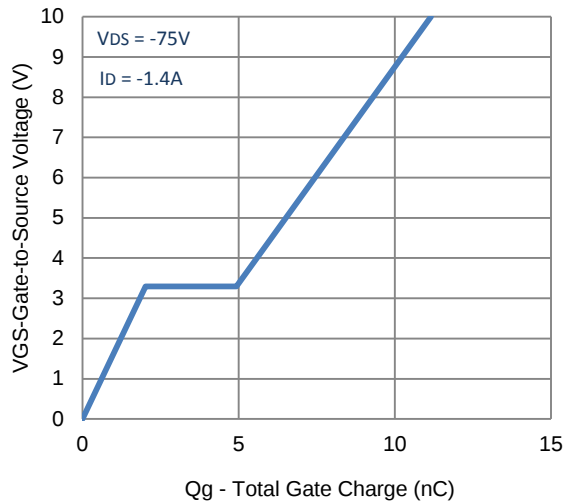


5. Output Characteristics

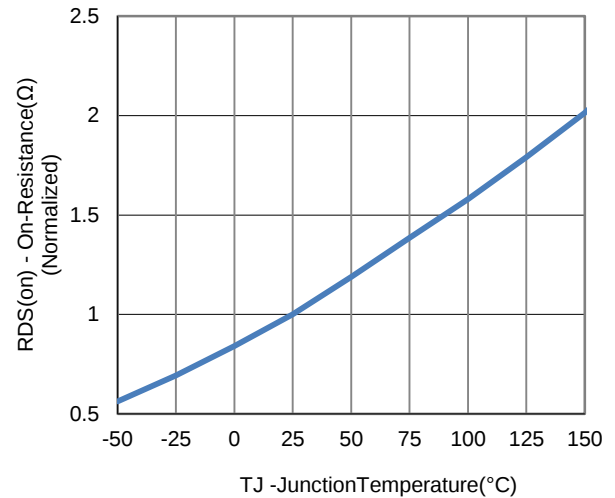


6. Capacitance

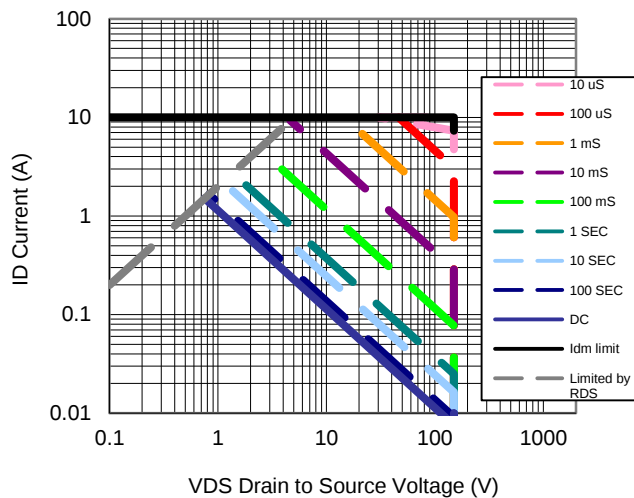
Typical Electrical Characteristics - P-channel



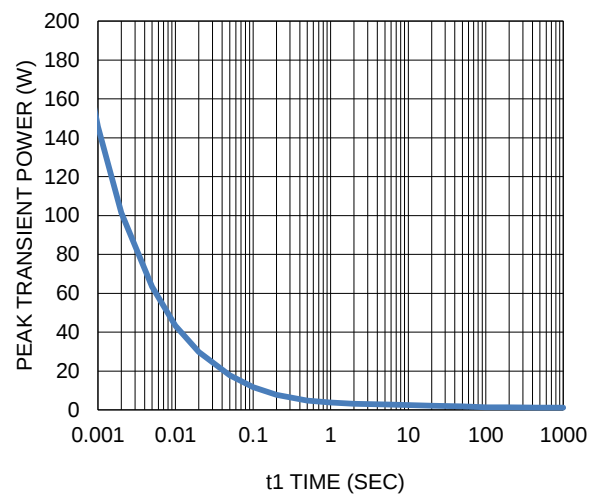
7. Gate Charge



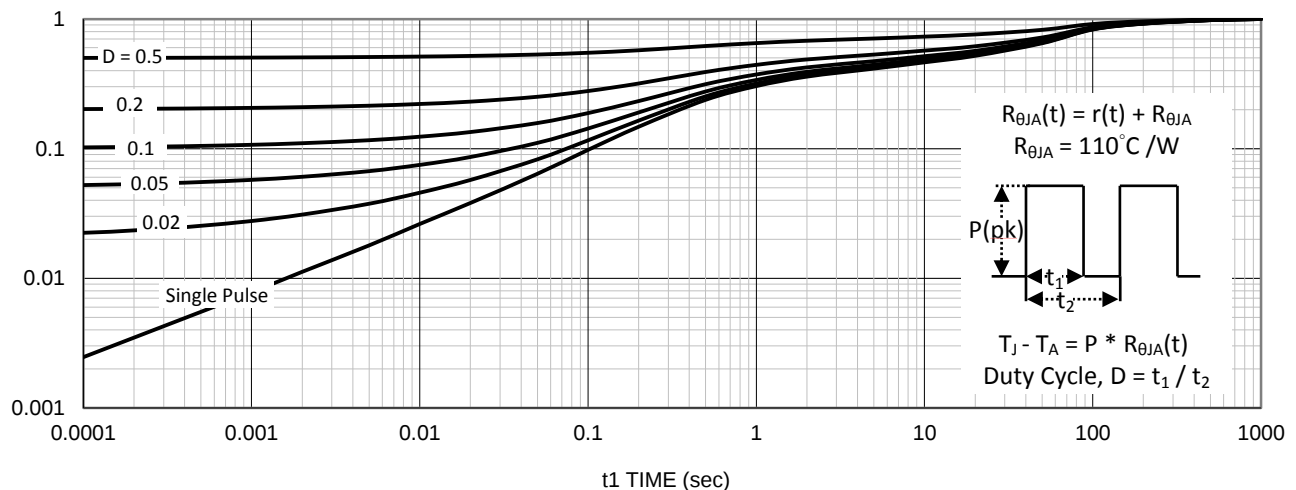
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

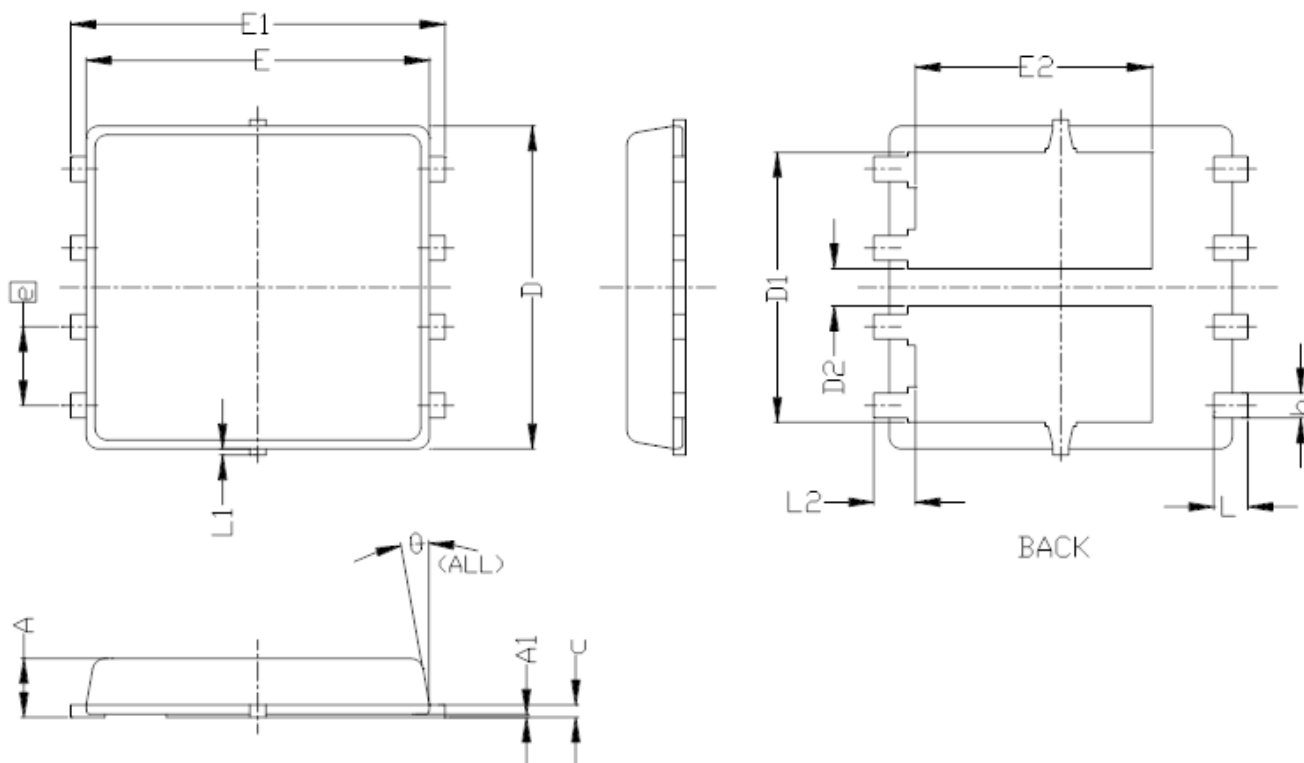


10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient

Package Information



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.85	0.95	1.00	0.033	0.037	0.039
A1	0.00	—	0.05	0.000	—	0.002
b	0.30	0.40	0.50	0.012	0.016	0.020
c	0.15	0.20	0.25	0.006	0.008	0.010
D	5.20 BSC			0.205 BSC		
D1	4.35 BSC			0.171 BSC		
D2	0.50	0.60	0.75	0.020	0.024	0.030
E	5.55 BSC			0.219 BSC		
E1	6.05 BSC			0.238 BSC		
E2	3.82 BSC			0.150 BSC		
e	1.27 BSC			0.050 BSC		
L	0.45	0.55	0.65	0.018	0.022	0.026
L1	0	—	0.15	0	—	0.006
L2	0.68 REF			0.027 REF		
θ	0°	—	10°	0°	—	10°